

Demand Response Tools and Survey for Industrial, Agricultural, and Water End Users

Problem Statement

The Energy Action Plan, Integrated Energy Policy Report and the initial publicly released priorities of the new governor all indicate that DR is a key element of future energy actions and policies. For the PIER Program to meet the identified need for building an infrastructure for demand response programs, it is critical to understand all the elements of how end use customers select and respond to individual demand response programs. Encouraging end use customers to modify their load based on the demand needs of the electrical grid has the potential of providing significant improvements in T&D system reliability and stability. The Energy Commission has ongoing research areas in the application of demand response initiatives with commercial buildings in California. While many of these efforts are directly relevant for the IAW end users, there are many areas unique to the IAW community that is currently not being addressed by these ongoing efforts. WG#2 from CPUC Ruling R.02-06-001 is actively managing ongoing efforts with Critical Peak Pricing (CPP), Demand Bidding (DBP) and Real Time Pricing (RTP). Based on initial data, several of the early adopters of the CPP and DBP are IAW end users. However, the overall end user participation in CPP, DBP and RTP pilot or tariff programs is much lower than originally expected.

The IAW community represents over 30% of the energy used by the State of California and IAW end users represent a very large potential for future DR related energy load reductions and DR energy management programs. Representatives of the PIER IAW Staff routinely interact with the IAW community and have established a very productive working relationship with several industry associations and key end users throughout the state. During these interactions, several key areas of desired research always surface from the IAW end user community:

- What is the business impact of a specific new DR pilot or tariff on the business operations of a specific IAW end user? To what extent can these business impacts be generalized across a class of IAW customers?
- What interactive analysis tools can be developed to assist prospective IAW DR participants to better understand the benefits and costs of new DR pilots or tariffs, and are these analysis tools likely to be accurate enough to be useful in encouraging appropriate decisions by individual IAW customers?
- What results of existing IAW DR program participants can be shared with other IAW end users to encourage them to more actively participate in future DR pilots and tariffs?

Relationship to PIER Goals

This project meets the PIER Goal of “Improving the Reliability/Quantity of California’s Electricity” by encouraging end use customers to participate in demand response programs and thereby reduce the overall demand on the electrical grid during times of peak demand. The agreement also meets the secondary goal of “Improving the Energy Cost/Value of California’s Electricity” by providing end use customers new energy pricing options that permit them to meet their electrical needs and lower total costs.

Goals of this Project

The goal of this project is to obtain a better understanding of the decision factors industrial and agricultural end users apply when determining if they will or will not participate in future demand response tariffs and initiatives. Of specific interest in this effort is to define some of the key business financial decisions that must be made to understand the costs and benefits of active participation in specific DR programs such as CPP, DBP and RTP. An additional goal of this effort is to identify specific homogeneous groups of IAW businesses that are good candidates for future DR tariffs and programs to help California utilities reach their published DR participation targets.

Objectives of this Project

The objectives of this project are to:

- Complete an interactive research effort with industrial and agricultural end users that will provide specific insight into the key decision elements that California IAW end users consider when determining to participate or not to participate in DR tariffs or programs
- Conduct a literature review of research that has been conducted in California and other areas of the country to gain insight into issues associated with the participation of IAW end use customers in existing DR programs
- Develop, test and demonstrate interactive business tools that will provide IAW end users with additional information on the business and financial impact of participating or not participating in future DR tariffs or programs.
- Based on the research information gathered, develop specific homogeneous groups of IAW businesses that are good candidates (and not good candidates) for future DR tariffs and programs.

Program Activities

This project has three major activities:

1. Develop a Comprehensive DR Survey for Industrial and Agricultural Businesses.

- Develop a comprehensive DR Survey for industrial and agricultural end user businesses to:
 - a. determine awareness of DR programs
 - b. better understand how these end use customers select DR programs
 - c. determine how they respond to individual demand response programs
 - d. Identify the type and characteristics of tools that can assist energy managers in their decision-making process.

This is necessary to provide the Energy Commission PIER Program a better understanding of the Industrial and Agricultural business decisions that need to be made to support future DR tariffs and programs.

- Work interactively with industrial and agricultural end users associations and end user energy managers to identify the key elements required to develop a DR survey that will address the critical DR related issues and concerns of the industrial and agricultural businesses.
- Complete the necessary research, interviews and other activities required to obtain a balanced understanding of the industrial and agricultural businesses' DR opportunities and concerns.
- Build off the survey efforts of the WG#2 M&E Contractor so that the results of this survey can be correlated with the results of the WG#2 M&E Contractor results.

2. Develop DR Business Decision Analysis Tools for Industrial and Agricultural Businesses

- Design and develop interactive business decision analysis tools that will assist prospective industrial and agricultural DR participants to better understand the benefits and costs of new DR pilots or tariffs.
- As part of this process, a detailed review on the available information about the tools that were developed and used by the IOUs for the WG#2 2003 and 2004 programs will be completed prior to starting the tool development for this effort.
- For each proposed tool to be developed, the following DR Business Tool Overview will be provided to the Commission Contract Manager or his designated representative:
 - a. Brief description of the business analysis tool
 - b. Business purpose the tool provides
 - c. Specific results and outcomes expected from the use of the tool, including the cost assessment to implement DR programs.
 - d. Specific segment of industrial and agricultural businesses that will benefit from the tool

- e. Comments and recommendations from industry and agricultural energy manager representatives who reviewed the proposed tool
- f. Schedule and budget for the development, testing and application of the tool

NOTE: No tools developed for this effort will be proprietary or have restricted access or use. The use of commercial industry standard software such as MS Word, Excel, PowerPoint and others are acceptable as long as it is reasonable to expect the industrial or agricultural energy manager to have access to this software. If a tool is intended to be made accessible via the internet, customers must be able to access this information via a standard web browser.

- Propose a minimum of two decision tools for consideration and approval in this effort:
 - a. At least one tool will be oriented specifically for the industrial segments.
 - b. At least one tool will be oriented specifically for the agricultural segments.
- Monitor the use of the tools by the end user energy managers to ensure proper understanding and operation
- Obtain end user assessments of the tools and document an recommended improvements

3. Define Homogeneous Groups of Candidate Industrial and Agricultural DR End Users

- Define homogeneous groups of candidate industrial and agricultural DR end users that, based on the research completed in this effort, are either good candidates or not good candidates for future DR tariffs and programs.
- For each group defined, provide a summary report that provides the following:
 - a. Definition of the homogeneous group
 - b. Why the homogeneous group was selected
 - c. Methods and capabilities of this group to participate (or not to participate if appropriate) in future DR tariffs and programs
 - d. Amount of electrical DR load reductions that are possible by individual members and the group as a whole and at what costs to the participating end user
 - e. Response time and recovery time of the identified DR load reductions
 - f. Estimated size of this group in California
 - g. Any unique elements or limitations of the group
- A minimum of two homogeneous groups will be defined for the industrial segment

- A minimum of two homogeneous groups will be defined for the agricultural segment

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